



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/516,504

12/02/2004

Hiroyuki Mizuguchi

081356-0226

8630

22428 7590 03/30/2009

FOLEY AND LARDNER LLP  
SUITE 500  
3000 K STREET NW  
WASHINGTON, DC 20007

EXAMINER

MARVICH, MARIA

ART UNIT

PAPER NUMBER

1633

MAIL DATE

DELIVERY MODE

03/30/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/516,504	<b>Applicant(s)</b> MIZUGUCHI ET AL.	
	<b>Examiner</b> MARIA B. MARVICH	<b>Art Unit</b> 1633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 3/6/09.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,5-11,13-17 and 19-21 is/are pending in the application.
- 4a) Of the above claim(s) 8-11 and 13-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,5-7 and 19-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>3/6/09</u> .  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/6/09 has been entered.

Claims 1, 5-11, 13-17 and 19-21 are pending in the instant application. Claims 8-11 and 13-17 are withdrawn from further consideration and therefore, claims 1, 5-7 and 19-21 are under examination.

### ***Claim Objections***

Claim 6 is objected to because of the following informalities: the amendment to claim 6 did not delete the word "from".

Claim 19 recites "wherein the adenovirus type 35 vector according to claim 1 is allowed to infect a target cell". Recommendation is made to amend the claim to recite -- wherein the adenovirus type 35 vector according to claim 1 infects a target cell--. Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 7 and 19 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Vogels et al (6,492,169; see entire document). **This is a new rejection necessitated by applicants' amendment. Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.**

The instant claims are drawn to an adenovirus type 35 vector wherein the E1 region is deleted. The instant claims limit the deletion to between 367 and 2,917.

Vogels et al teach an Ad35 vector comprising a deletion in the E1 region in which the vector is deficient in E1 wherein the deletion is at about 453 and 2804 (see figure 21 and bridging ¶ col 21 and 22). The intent of the deletion is to insert heterologous genes into these deletions (see e.g. figure 6) and obliterate E1 gene functions while retaining the pIX promoter and the pIX gene. The virus is used to infect target cells.

The instant specification teaches "In particular, the term "E1-deleted region" refers to an E1 protein-encoding region that is functionally defective" (page 6). The sequences were chosen with this purpose in mind and do not appear to provide an advantage over similar deletions. "Specifically, the adenovirus vector according to the present invention may comprise part of the E1 region of the adenovirus type 35 genome as long as the E1 protein that functions in a host cell

Art Unit: 1633

is not expressed. The "E1-deleted region" may lack all or part of the Ela or Elb region, may lack all of both regions, or may lack a portion that spans both regions, as long as an E1 protein-encoding region is functionally defective". Similarly, the E3 region is deleted in the instant claims to abrogate function of the E3 genes. Because the Office does not have the facilities for examining and comparing the applicant's product with the products of the prior art, the burden is on the applicant to show a novel or unobvious difference between the claimed products and the products of the prior art (e.g. that the products of the prior art do not possess the same material structural and functional characteristics of the claimed product). See *in re Best*, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977). To this end, the deletions of Bett et al are indistinguishable from that of the instant invention.

As well, KSR forecloses the argument that a specific teaching, suggestion or motivation is required to support a finding of obviousness. See the recent Board decision *Exparte Smith* -- USP2d--, slip op. at 20, (BD. Pat. App. & Interfer. June 25, 2007). In light of this, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the vector of Betts et al is indistinguishable from that of the instant claims because Betts teaches that the ad35 vector is deficient in E1 function. As well, it is within the ordinary skill of the art to use available methodologies to isolate a variety of vectors comprising any of a number of deletions that resulting E1 inactivation. One would have been motivated to do so in order as the ability to modify sequences by applying conventional methodologies. Based upon the teachings of the cited references, the high skill of one of ordinary skill in the art, and absent evidence to the contrary, there would have been a reasonable expectation of success to result in the claimed invention.

Claims 1, 5-7 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vogels et al (6,492,169; see entire document) in view of Wadell et al (US 2004/0136958; see entire document). **This is a new rejection necessitated by applicants' amendment. Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.**

The instant claims are drawn to an adenovirus type 35 vector wherein the E1 and E3 regions are deleted. The instant claims limit the deletion to between 367 and 2,917 and 27,760-29,732.

The teachings of Vogels et al are as above. Vogels does not provide direction on E3 deletions.

Bett et al teach an Ad35 vector comprising a deletion in the E1 region in which the vector is deficient in E1 as well as deletion in the E3 region (see e.g. ¶ 65 and 73-80). A heterologous gene is inserted into the E1 region or the E3 region.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include an E3 deletion as the art has established that vectors for gene therapy are improved by this deletion and because Betts et al demonstrate that it is of ordinary skill in the art to delete the E3 region. the E3 region is deleted in the instant claims to abrogate function of the E3 genes. Because the Office does not have the facilities for examining and comparing the applicant's product with the products of the prior art, the burden is on the applicant to show a novel or unobvious difference between the claimed products and the products of the prior art (e.g. that the products of the prior art do not possess the same material structural and functional

characteristics of the claimed product). See *in re Best*, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977). To this end, the deletions of Bett et al are indistinguishable from that of the instant invention.

As well, KSR forecloses the argument that a specific teaching, suggestion or motivation is required to support a finding of obviousness. See the recent Board decision *Exparte Smith -- USPD2d--*, slip op. at 20, (BD. Pat. App. & Interfer. June 25, 2007). In light of this, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the E3 deletion of Betts et al is indistinguishable from that of the instant claims because Betts teaches that the ad35 vector is deficient in E3 function as is required of the instant invention. As well, it is within the ordinary skill of the art to use available methodologies to isolate a variety of vectors comprising any of a number of deletions that resulting E3 inactivation. One would have been motivated to do so in order as the ability to modify sequences by applying conventional methodologies. One would have been motivated to do substitute known vectors using known methods to provide improved gene therapy vectors. Based upon the teachings of the cited references, the high skill of one of ordinary skill in the art, and absent evidence to the contrary, there would have been a reasonable expectation of success to result in the claimed invention.

Claims 1, 7 and 19-21 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Vogels et al (6,492,169; see entire document) in view of Wadell et al (US 2004/0136958; see entire document). **This is a new rejection necessitated by applicants' amendment. Applicant cannot rely upon the foreign priority papers to overcome this rejection because a**

**translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.**

The instant claims are drawn to an adenovirus type 35 vector wherein the E1 region is deleted. The instant claims limit the deletion to between 367 and 2,917 or 3,375 and wherein the virus is used to infect CD34+.

The teachings of Vogels et al are as above except neither teaches infection of CD34+ cells.

Wadell et al teach that Ad35 has high affinity to CD34+ cells (see e.g. ¶ 134).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to infect the vector of Betts et al into CD34+ cells as taught by Wadell et al because Betts teaches develop the ad35 vector as a vector for transduction purposes and because Wadell et al teach that Ad35 has high tropism for CD34+ cells. One would have been motivated to do substitute known vectors using known methods to provide therapeutic vectors to CD34+ cells. Based upon the teachings of the cited references, the high skill of one of ordinary skill in the art, and absent evidence to the contrary, there would have been a reasonable expectation of success to result in the claimed invention.

### ***Response to Argument***

Applicants' arguments filed 5/22/08 have been fully considered but they are not persuasive. The vector of Vogels et al depicts in the figures and the text that the pIX promoter is retained.



***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARIA B. MARVICH whose telephone number is (571)272-0774. The examiner can normally be reached on M-F (7:00-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Woitach, PhD can be reached on (571)-272-0739. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Maria B Marvich, PhD  
Primary Examiner  
Art Unit 1633

/Maria B Marvich/  
Primary Examiner, Art Unit 1633